

What is claimed is:

- 1 1. An echo cancellation unit comprising:
2 an adaptive filter to generate a current echo model;
3 a convergence metric computation unit; and
4 a model store to store the current echo model from the adaptive filter as a
5 saved model in response to an indication from the convergence metric computation
6 unit:
- 1 2. The echo cancellation unit of claim 1 further comprising:
2 a distance measurement unit to measure a distance between the current echo
3 model and the saved model; and
4 a threshold comparator responsive to the distance measurement unit to
5 facilitate restoring the saved model as the current echo model.
- 1 3. The echo cancellation unit of claim 2 wherein the current echo model in the
2 adaptive filter has a plurality of coefficients, and the model store stores a subset of
3 the plurality of coefficients.
- 1 4. The echo cancellation unit of claim 2 wherein the distance measurement unit
2 is coupled between the adaptive filter and the model store to facilitate a distance
3 measurement between the current echo model and the saved model for a plurality of
4 time lags.
- 1 5. The echo cancellation unit of claim 1 further comprising a reconvergence unit
2 to restore the saved model as the current echo model.
- 1 6. The echo cancellation unit of claim 5 wherein the reconvergence unit
2 comprises:

3 a distance measurement unit to compare the current echo model and the saved
4 model over a plurality of time lags; and
5 a comparator coupled to the distance measurement unit, to restore the saved
6 model as the current echo model at a matching time lag.

1 *T.* A speakerphone system comprising:
2 an output device to drive a speaker, the output device being responsive to a
3 reference node coupled to a communications channel;
4 an input device responsive to a microphone; and
5 an echo cancellation unit coupled to the reference node and the input device,
6 such that the echo cancellation unit utilizes data from the reference node to remove
7 echo from a signal received at the microphone;
8 wherein the echo cancellation unit includes a model store to store a current
9 echo model when a real-time error occurs.

1 8. The speakerphone system of claim 7 wherein the speakerphone system is
2 implemented in a computer, and the echo cancellation unit is implemented in
3 software, the echo cancellation unit being coupled to the input device and reference
4 node using memory in the computer.

1 9. The speakerphone system of claim 7 wherein the echo cancellation unit
2 further includes a real-time error detector to detect when a real-time error has
3 occurred, and to direct the model store to receive the current echo model, to create a
4 saved model.

1 10. The speakerphone system of claim 9 wherein:
2 the echo cancellation system includes an adaptive filter having an input
3 power and an output power; and

4 the real-time error detector is coupled to the adaptive filter to compare the
5 input power and the output power of the adaptive filter.

1 11. The speakerphone system of claim 9 wherein the echo cancellation unit
2 further includes a reconvergence unit to compare the current echo model with the
3 saved model.

1 12. The speakerphone system of claim 11 wherein the reconvergence unit is
2 coupled between the model store and the adaptive filter to compare the current echo
3 model with the saved model for a plurality of time lags, and to conditionally replace
4 the current echo model with the saved model at a matching time lag.

1 13. The speakerphone system of claim 9 wherein echo return loss enhancement is
2 measured by the real time error detector, and a real-time error is detected when an
3 inversion in echo return loss enhancement occurs abruptly.

1 14. A computer-implemented method for reconvergence of an adaptive filter
2 comprising:
3 comparing a current model in the adaptive filter with a stored model, and
4 replacing the current model with the stored model when a match is found within a
5 distance measure.

1 15. The computer-implemented method of claim 14 further comprising:
2 determining a convergence metric value that describes a level of convergence
3 of the adaptive filter; and
4 comparing the current model with the stored model when the convergence
5 metric value is above a threshold.

